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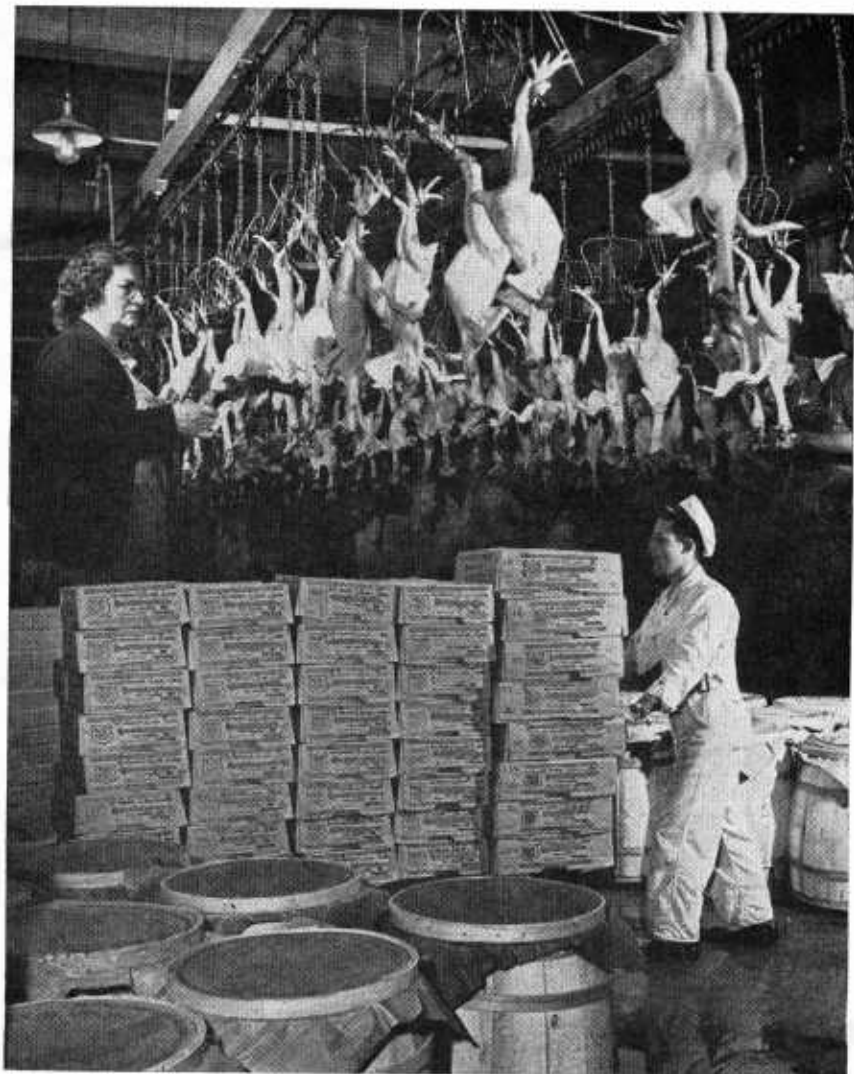
Rev.

# MARKETING

## *poultry*



Farmers' bulletin no. 1377



U. S. DEPARTMENT OF AGRICULTURE

### ***Live poultry for market***

- Can, if thin, be fattened profitably for a week or 10 days.
- Should be graded by age, sex, and size, and the different classes should be shipped in separate coops.
- Should be fed liberally just before shipment and, if 24 or more hours will elapse before they reach the market, a tin can or two, filled with whole corn well soaked in water, may be nailed in each coop to provide the birds with food and water and to cut down shrinkage during shipment.

### ***Poultry dressed by the producer***

- Can be fattened profitably for 10 to 14 days before being killed.
- Should be fasted at least 12 hours before being killed, but should be given plenty of fresh, clean water to flush out the crops and intestines.
- Must be well bled and cleanly picked according to market requirements.
- Should never be scald-picked for a market that prefers dry-picked or semiscalded.
- Must be thoroughly chilled to remove all body heat before being shipped.
- Should be graded for uniform quality and size; and those in poor condition of flesh, with torn skins or blemishes, should be shipped in separate packages.
- Should be packed in boxes or barrels lined with clean paper if dry-packed, or in unlined barrels in which holes have been bored, if ice-packed.
- Should be packed tightly so that they will not shift about in the package.
- Must be packed with alternate layers of cracked ice in warm weather.

### ***When live or dressed poultry is shipped***

- Packages or coops should be plainly marked with the address of the receiver and with the name and address of the shipper.
- Packages of dressed poultry should be marked as to the kind of poultry and the gross, tare, and net weights.

# Marketing poultry

By Rob R. Slocum, Principal marketing specialist,  
Food Distribution Administration

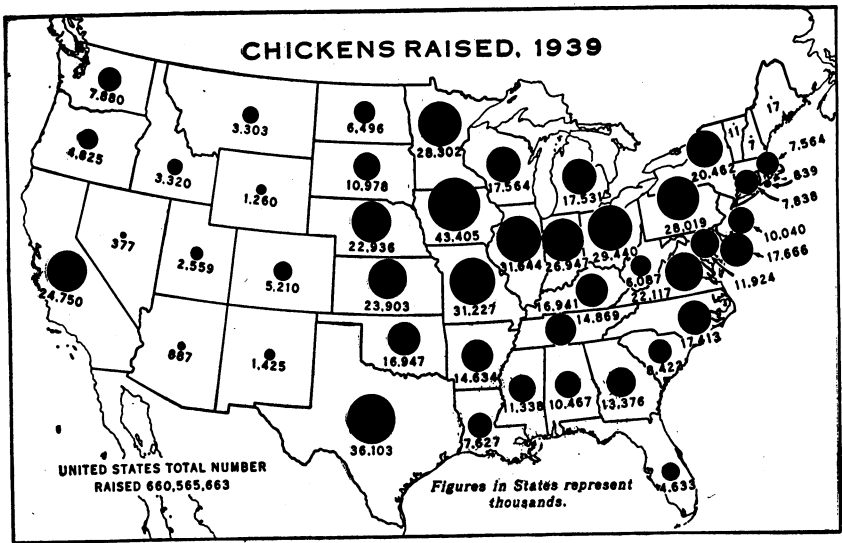
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**There is** much less specialization on farms in this country in raising market poultry than in producing eggs. In some localities near large consuming markets limited attention is given to the production and finishing of poultry for special trade outlets, but most of the fine table poultry coming to market consists of birds that have been finished in the large poultry-feeding stations run in conjunction with poultry-packing houses. In eastern and northeastern United States in particular, and in some other sections, a considerable development in the "battery" raising of winter or out-of-season broilers has taken place during recent years. On Long Island, N. Y., and at other scattered points there is a highly specialized production of market ducklings, and the raising and fattening of turkeys on a commercial scale has become important in many sections during recent years.

## Where poultry is produced

Much of the market poultry is a byproduct incidental to the production of eggs, and on specialized egg farms market poultry is largely or entirely a secondary consideration. On general farms poultry is kept to supply



FDA 554

FIGURE 1.—Chickens are raised in practically all sections of the United States, but they are raised in greatest numbers in the Middle West.

both eggs and poultry for the table but primarily to produce eggs for sale. Under these conditions the great bulk of market chickens consists of old stock, like hens that are sold when they become unprofitable as layers and young surplus males produced in the course of raising pullets to renew the laying flocks.

Chickens are raised and marketed in practically all sections of the United States. There are centers of heavy production in the Eastern and Northeastern States and on the Pacific coast, but approximately 50 percent of the supply is produced in the East North Central and the West North Central States, principally on the general farms of that region. According to the 1940 Census, Iowa raised the greatest number of chickens in 1939—43,405,028—followed in order by Texas, Illinois, Missouri, Ohio, Minnesota, Pennsylvania, Indiana, California, and Kansas. The States of the Middle West not only raise more chickens and other poultry than other regions, but they also have a greater surplus above their own needs for shipment to the large centers of consumption (fig. 1).

The small cities obtain a part, and often a large part, of their poultry requirements from the territory immediately surrounding them; but local production is decidedly inadequate for the large cities, and a considerable part of their supply is drawn from the more remote surplus-producing sections. For example, during 1940 the receipts of live and dressed poultry at New York City from the States of New York, New Jersey, Pennsylvania, and Connecticut amounted to less than 16 and 18 percent, respectively, of the total receipts in that city of each of these classes. The reported number of chickens raised on farms in the United States in 1941 was 716,830,000.

## ***The problem of transportation***

In most cases the large poultry-consuming cities (fig. 2) are long distances from the surplus-producing areas of the Middle West and other sections. The problem is one of moving the poultry from the sources of production to the points where it is needed in such a way as to insure its arrival in the best possible condition and at the least possible cost. In the shipment of poultry to New York City an average haul of at least 1,000 miles is involved. The individual producer seldom has either the volume of product or the available facilities to cope with the problem efficiently. To meet this need the business of the poultry packer and shipper has developed.

For efficiency and economy in handling, the poultry sold in small lots from the individual farms distantly located from the markets must be assembled at concentration points and shipped, either alive or dressed, in larger lots, usually in carlots or in large truck lots. Much of the poultry is dressed at these concentration points before being shipped to the final markets. This requires establishments especially equipped to feed, slaughter, pack, and refrigerate the poultry. As dressed poultry is highly perishable unless handled at low temperatures, the use of refrigerator cars or refrigerated trucks for shipping is essential. In shipping live poultry considerable distances, it is necessary to use cars or trucks especially constructed for this purpose, so that the poultry may receive proper care and feeding in transit and heavy shrinkage in weight be avoided.

The transportation of poultry from the areas of production to the points of consumption involves many complex problems and the performance of numerous services.

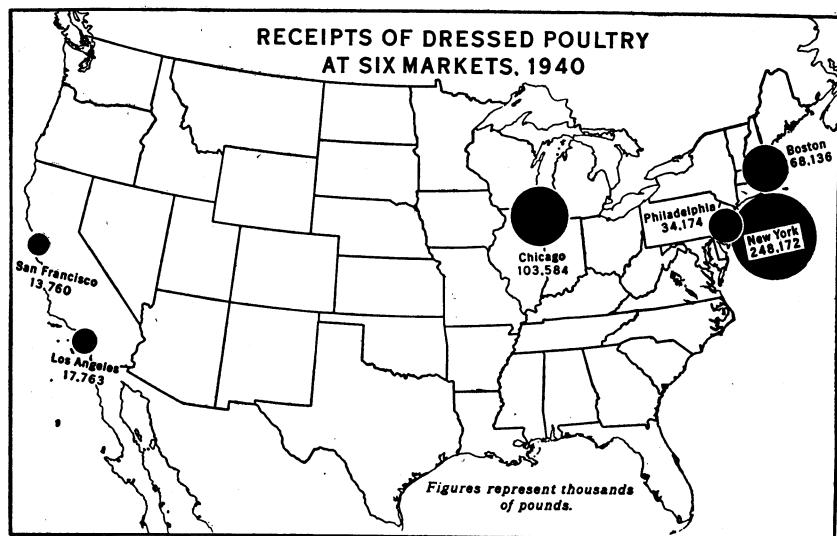


FIGURE 2.—Dressed poultry moves from the surplus-producing areas to the large cities that constitute the large consuming markets for this product.

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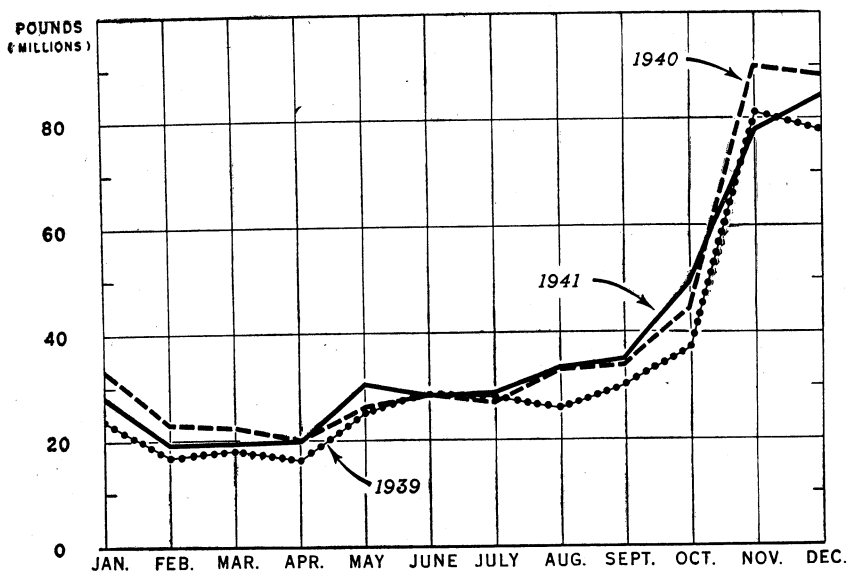


FIGURE 3.—Receipts of dressed poultry at five markets, 1939-41. FDA 557  
 Receipts of dressed poultry at New York, Chicago, Philadelphia, Boston, and San Francisco are heaviest in the late fall and early winter. They decline during the late winter and early spring and remain relatively light throughout the summer.

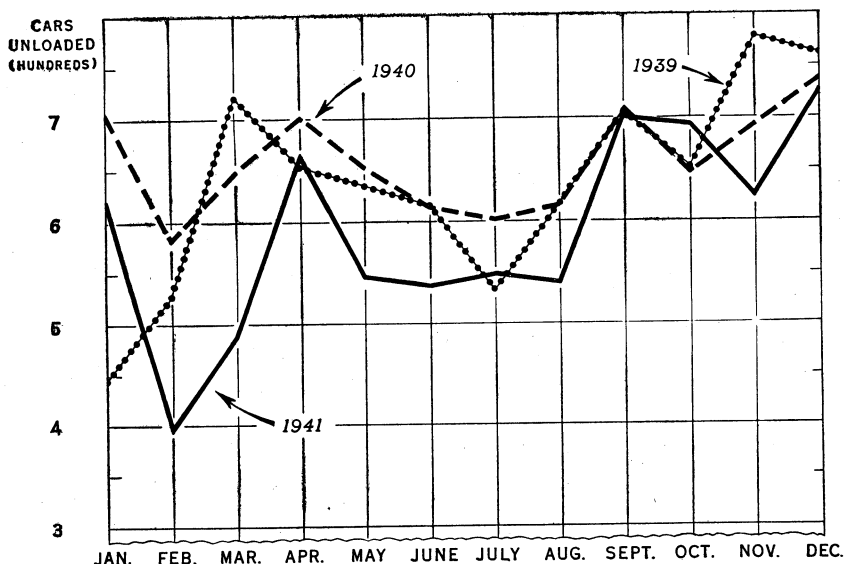


FIGURE 4.—Freight unloads, plus express and motortruck receipts of live poultry, New York City, 1939-41. FDA 556  
 Receipts are relatively stable throughout the year except for increased supplies in the spring and fall caused by the Jewish holidays and by Thanksgiving and Christmas.

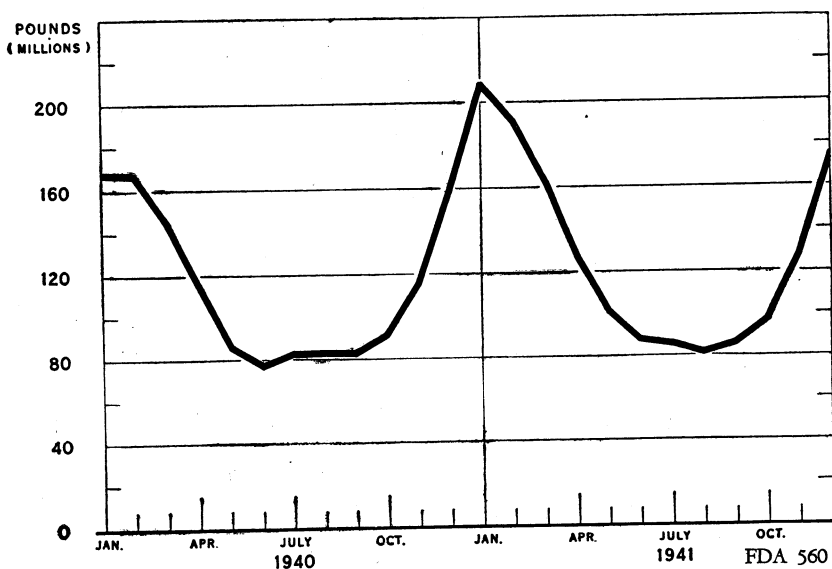


FIGURE 5.—Total cold-storage holdings of dressed poultry in the United States, 1940-41.

The stocks of dressed poultry in cold storage reach their low point from June to September after which time they increase rapidly.

### **Seasonal production**

Farm poultry production is seasonal in character. Chickens and other classes of poultry are normally hatched and reared during the spring and summer. The crop of surplus poultry available for sale from farm flocks is not large until June or July, and the surplus does not continue much beyond January. Specialized broiler and fryer production has, however, developed to a considerable extent in some areas, such as the Del-Mar-Va peninsula, the Shenandoah Valley of Virginia, and in Arkansas. Many of the farms in such areas raise broilers and fryers only, purchasing the chicks from commercial hatcheries. The chickens are usually raised to an age of about 14 weeks, at which time the entire crop, both male and female, is sold. Farms of this kind raise about three crops a year.

Most of the hens marketed are sold during the late summer and fall, after they have finished laying for the season. Smaller supplies of hens usually reach the markets throughout the year. The heavy demand for poultry, particularly turkeys, at Thanksgiving and Christmas also stimulates heavy shipments at those times. The seasonal character of the receipts of dressed poultry at the principal markets is illustrated in figure 3.

The movement of live poultry to market is much the same as that of dressed poultry, but seasonal differences are not so marked. The Jewish holidays, which occur in the spring and fall, bring an increased demand for live birds and stimulate shipments (fig. 4).

Because dressed poultry arrives on the markets during the fall and early winter in quantities larger than can be currently used, the surpluses are held



in cold storage until late winter and spring, when receipts are inadequate. Cold storage therefore serves as a balance between supply and demand. Without it, poultry probably would glut the markets at the normal period of marketing and probably would bring lower prices to producers at that season. With cold storage, the farmer is enabled to market his poultry when it is at its prime and at better prices than otherwise would be likely to prevail.

The consumer is also assured of an abundant supply of wholesome poultry of all classes throughout the year at a steadier price level than probably otherwise would be the case. Total stocks of poultry in cold storage reach their peak in January or February and then gradually decline, reaching their low point in the late summer or early fall (fig. 5).

### ***Methods of marketing***

Producers market their poultry either alive or dressed. When poultry is sold alive by the producer it may be concentrated into larger lots for shipment to market in that condition, or it may later be dressed by the poultry packer and shipped to market in that form. Much the larger portion of poultry leaves the producers' hands alive. The necessary processes of handling, dressing, and shipping the greater part of the poultry to market have developed a large and highly specialized poultry-packing industry.

This industry differs from the meat-packing industry in that it is carried on by many comparatively small establishments located throughout the poultry-producing sections, particularly in the Middle West, where the fowls that are not shipped to market alive are concentrated and dressed comparatively near the point of production.

### ***Market channels for poultry***

#### **PRODUCER TO CONSUMER**

Both live and dressed poultry are marketed by producers direct to consumers. The quantity sold in this way is relatively small; for it requires the producer to establish a contact with consumer purchasers. This may mean special finishing or fattening. The prices received are usually better than prices received through other methods of marketing, but the costs are generally higher. Usually delivery is made direct to the consumer's door, or sale is made on the producer's own premises or through a roadside market. In recent years the quantity of poultry sold at roadside markets has increased considerably.

#### **PRODUCER TO POULTRY DEALER**

The most common method of marketing poultry, if the producer is within easy shipping distance of a large consuming market, is to ship it alive in coops by motortruck or express to a poultry dealer. The dealer may buy it for slaughter, or may sell it on commission, or buy it for his own account, at or in relation to prevailing market quotations. In some sections motor-

truck buyers go from farm to farm buying live poultry and transporting it to market for sale or to a packing plant for slaughter.

In several of the Northeastern States live-poultry auctions are operated either as an independent enterprise or in connection with egg auctions. Producers bring their coops of poultry to such auctions, where they are sold to the highest bidders, who either represent dealers in the city markets or buy the poultry for their own outlets. Except in the case of turkeys or of poultry from farms specializing for market, such as ducks from farms on Long Island, very little poultry is actually slaughtered by producers and shipped by them to market as dressed poultry.

#### **PRODUCER TO POULTRY PACKER**

The great bulk of the poultry that supplies the large markets, like New York, is not produced on neighboring farms but is hauled a long distance from the producing sections. As it is impracticable to make shipments by truck or express from individual farms for such a distance, a market channel has been developed through which carload lots or large truck lots of live and of dressed poultry are concentrated at shipping points. Briefly traced, this channel from producers to consumers ordinarily is as follows: The farmer sells his poultry alive at his farm to a trucker or ships or delivers it alive to a buyer in a nearby town or to a poultry packer located at a concentration point. The trucker or the local buyer may be an independent buyer, or he may operate as an agent or buyer for the packer and deliver or sell the poultry he buys to the poultry-packing house.

When received at the packing house, the poultry may be sorted out for carlot shipment alive by fast freight to the final market. Or, what is more usual, it may be held on the feeding floor for 1 or 2 weeks before it is dressed, chilled, graded, and packed and then shipped in refrigerator cars or by refrigerated motortrucks to large consuming markets either for immediate consumption or for holding in cold storage for future sale. The dressed-poultry dealers in the large markets may sell to jobbers or may supply hotels, restaurants, retailers, and other large outlets direct. Jobbers supply retailers and other large buyers, who in turn supply consumers.

In some of the larger cities an organization composed of dealers, known as the poultry exchange or poultry board, formulates rules that govern the trading in poultry by its members, establishes grades, and maintains quarters where dealers may meet to buy and sell and to consider matters of general interest.

#### **COOPERATIVE MARKETING**

The cooperative marketing of poultry is not so common as the cooperative marketing of eggs. But some of the larger egg cooperatives have developed their plants to handle poultry also, and in such instances they may perform for their members all the customary services of the poultry-packing plant. In some of the Southern States cooperative marketing of live poultry has been undertaken to a considerable extent. Where this practice is followed, on advertised dates, a freight car is placed, at various points, so that pro-

ducers may bring their poultry to place in it. The car is shipped to market and its contents are sold by the producers' representatives; or if bids have previously been obtained from interested dealers or shippers, the poultry is delivered to the successful bidder.

A considerable proportion of the turkeys grown in the Northwestern States are marketed cooperatively. Sometimes the turkeys so handled are dressed by the growers and delivered at specified points on agreed-upon dates. At these points the dressed turkeys are graded by Federal-State graders, then packed, pooled, and consolidated in carlots for shipment. Each producer is given an advance payment according to the quantity and grades of the turkeys he delivers. After final sale of the turkeys has been effected by the cooperative organization's sales agencies, the further proceeds, minus operating costs, are prorated back to the producers.

### ***Market grades and quotations***

Market grades and quotations for poultry are not uniform in the different markets. In some markets in which the demand is for birds of certain weights bearing descriptive local names or terms, custom has resulted in the quoting of grades which may not appear in the quotations of other markets. In the main, however, the different terms used indicate fairly definitely the various kinds and to some extent the qualities of market poultry.

Poultry quotations cover the three main classes, that is, live, fresh-dressed, and frozen. Poultry in this third class is that which has been frozen and held in cold storage for varying periods of time.

Various subclasses, based upon condition, age, and sex, may be mentioned in the dressed-poultry quotations. A few other factors may be taken into account in quotations of dressed-poultry prices, chief among which are whether the poultry is scalded or dry-picked, ice- or dry-packed, and milk- or grain-fed. Style of package and weight of a dozen birds of a certain grade may influence the price. Quotations may also specify the point of origin, as "southern" or "western," especially if market grades are not clearly defined.

As a rule, dry-picked or semiscalded poultry is better appearing and of better keeping quality than hard-scalded poultry. It generally brings better prices, although in some markets no discrimination is made against scalded poultry.

Ice-packed poultry is usually placed in barrels with alternate layers of crushed ice and poultry. Ice packing is usually resorted to only when facilities for freezing or for shipping in refrigerator cars are not available or when the shipment is small. Ice-packed poultry is more likely to arrive in poor condition than is dry-packed poultry which has been chilled or frozen and shipped in refrigerator cars.

"Milk-fed" is a term used to designate poultry that has been fattened or finished on a ration of buttermilk and ground grain. Milk-fed poultry is of the highest quality and is invariably quoted higher than unfinished or farm-fed poultry, which may be quoted as "corn-fed" or "grain-fed."

Poultry properly graded and packed in boxes has a more attractive appearance than that packed in barrels. In addition, it is customary for many packers to put their lower grades, including old cocks, in barrels and their better grades in boxes. For these reasons box-packed poultry is usually quoted at higher prices than barrel-packed.

Quotations on poultry, both live and dressed, are usually on the pound basis, but there are some exceptions. Guineas and pigeons are commonly quoted by the pair or dozen, and squabs, although occasionally quoted by the pound, are usually quoted by the dozen.

Commonly two or more grades are made for each of the various classes of dressed poultry. The better grade or grades include those birds that are in good condition of flesh, clean, well-dressed, and comparatively free from pin feathers and tears of the skin. The lower grades include birds that are in thin flesh, are poorly dressed, pinfeathery, or humpbacked, or have torn or bruised skin. No. 3 poultry consists of birds inferior to both of these grades.

The following market classes of dressed poultry are in common use, and some or all of them will be found in every important market:

#### **Broilers**

Broilers are young chickens approximately 8 to 12 weeks old, of either sex, of marketable age but not weighing over  $2\frac{1}{2}$  pounds each or 30 pounds a dozen, and sufficiently soft-meated to be cooked tender by broiling. The lighter weights are sometimes quoted as squab broilers.

#### **Fryers**

Fryers are young chickens approximately 14 to 20 weeks old, of either sex, weighing over  $2\frac{1}{2}$  pounds but not over  $3\frac{1}{2}$  pounds each or 31 to 42 pounds a dozen, and sufficiently soft-meated to be cooked tender by frying.

#### **Roasters**

Roasters are young chickens approximately 5 to 9 months old, of either sex, weighing over  $3\frac{1}{2}$  pounds each or over 42 pounds a dozen, and sufficiently soft-meated to be cooked tender by roasting.

#### **Stags**

Stags are male birds of any weight, with flesh slightly darkened and toughened, and with comb and spur development showing the bird to be in a state of maturity between roasting chickens and cocks. Stags are less desirable and bring a lower price than soft-meated chickens.

#### **Capons**

Capons are unsexed male birds weighing over 4 pounds, usually from 7 to 10 months old, and with soft and tender flesh. The heavier capons are usually quoted at a higher price than the lighter capons.

#### **Slips**

Slips are incompletely caponized male birds weighing over 4 pounds, with comb, spur, and flesh development similar to stags. They are sometimes called capon roasts. The price of slips is considerably below that of capons.

### **Cocks**

Cocks are mature male birds of any weight with darkened and toughened flesh. Sometimes they are quoted as old roosters.

### **Fowl**

Fowl are mature female birds of any age or weight. They are generally divided into several subclasses according to weight, and the lighter weights usually bring a lower price.

### **Ducks**

Ducks are often quoted as such without any other distinction but are quite commonly quoted as young, old, or breeder ducks. Young ducks are immature birds, usually from 10 to 12 weeks old, with soft-meated flesh. At times young ducks may be referred to as spring ducklings. Old ducks are mature birds of either sex with toughened flesh. The Pekin ducklings produced on Long Island and on duck farms in other sections have become widely known and are commonly quoted as "Long Island ducklings."

### **Geese**

Geese are commonly quoted as such but may be referred to as young or old geese. Young geese are immature birds of either sex and of any weight, usually less than 1 year old. Old geese are mature birds of either sex more than 1 year old and of any weight. The actual condition of geese influences the price considerably, and specially fattened geese usually bring a premium. Chinese or swan geese are usually quoted separately and bring a lower price. Geese that have been partly plucked for feathers or down within 2 weeks of the time they are slaughtered, usually show small red spots on the skin and usually bring a lower price than do full-feathered geese.

### **Turkeys**

Turkeys are commonly quoted as young and old and as hens and toms. Old turkeys are those over 1 year old with toughened flesh and hardened breastbone. Turkeys classed as young are usually less than 1 year old, are soft-meated, and have flexible breastbones. Young turkeys generally sell for the highest price, followed in order by old hens and old toms.

### **Guineas**

Guineas may be quoted as young or old. Young guineas are immature birds of either sex, are soft-meated, and usually weigh less than 2 pounds. Old guineas are mature birds of either sex with toughened flesh and usually weigh 2 pounds or over. Guineas are used largely as a substitute for game. They are often quoted by the pair. At certain seasons guinea broilers may be quoted. In some markets guineas are called "keets" or "guinea keets."

### **Squabs**

Squabs are young pigeons of either sex, usually from 3½ to 4½ weeks old, with muscle fiber undeveloped by flying. At this age they retain their softness of flesh and "baby" fat. They are commonly quoted by the dozen, and differences in price are based upon their weight per dozen and upon

their color. The best grades run 10 to 12 pounds per dozen. The most desirable squabs are light in color.

### **Pigeons**

The term "pigeons," as used in market quotations, refers to mature birds. They are commonly sold by the pair but may be quoted by the dozen.

In practically all classes of dressed poultry, subclasses based upon the weight of the birds, either per dozen (the number commonly packed to a box) or the weight per bird, are commonly used.

Tentative United States classes and grades for dressed poultry have been prepared by the United States Department of Agriculture. Under these specifications young chickens are classified as broilers, fryers, roasters, stags, and capons; old chickens as fowl and cocks; ducks as young and old; geese as young and old; squabs in a class by themselves; and turkeys as young hens, young toms, old hens, and old toms. Further classification is provided according to method of plucking, as scalded, semiscalded, or dry-picked; according to the method of dressing, as drawn or undrawn; according to the method of finishing, as milk-fed or grain-fed; according to the method of chilling, as fresh-dressed, fresh hard-chilled, or frozen, and according to method of packing, as dry-packed or ice-packed.

Four quality grades are provided, which, in the order of their excellence, are: U. S. Grade AA; U. S. Grade A; U. S. Grade B; and U. S. Grade C. These quality grades are based on the degree of fleshing, conformation, condition of flesh, bleeding, and freedom from dressing defects or deformities.<sup>1</sup>

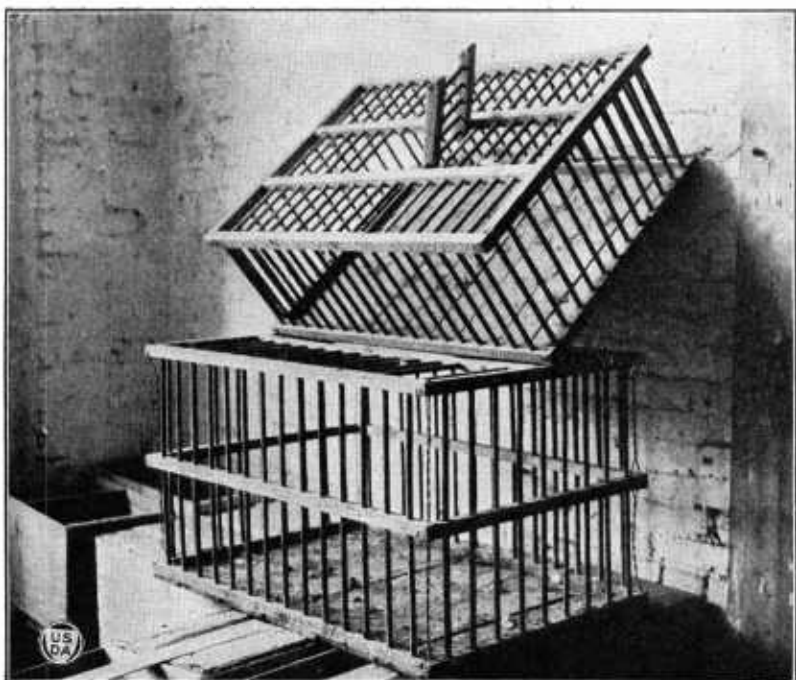
Such grades, which are defined by Federal standards, reduce confusion and waste and help prevent unfair marketing practices. They furnish a reliable and universal measure of quality for the producer and also the distributor and consumer. The producer who markets high-quality poultry is repaid by the higher prices to which the better grades entitle him. The distributor is furnished with a quality gage which facilitates buying and selling, particularly at long distances. And the consumer is assured of obtaining a product the quality of which is in line with the price paid.

### **Marketing poultry alive**

Most poultry is sold or shipped alive by the producer. The exceptions are the considerable number of turkeys dressed on the farms by growers, the relatively small number dressed by producers for shipment to market or to supply a local retail trade, and that poultry marketed by certain specialized farms, such as the Long Island duck farms and a few goose-fattening farms. The average producer is not an expert in dressing poultry and he does not have the proper facilities for slaughtering, chilling, grading, packing, and shipping; the quantity of his output, too, is not sufficient to make the

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<sup>1</sup> For detailed information regarding United States standards and grades for dressed poultry write to the Food Distribution Administration, U. S. Department of Agriculture.



FDA 8742

FIGURE 6.—Coops 12 inches high for chickens and 20 inches high for turkeys are commonly used in shipping these fowls alive by truck or express.

installation of such facilities practicable. Most of the poultry marketed by producers, therefore, is sold alive.

At the larger eastern markets, especially New York, receipts of live poultry from nearby points constitute less than 20 percent of the total supply. They are not, therefore, sufficient to supply the demand, and it is necessary to obtain shipments in carlots from the poultry packers or shippers in the western producing sections. A large part of the demand comes from the Jewish population which requires the poultry to be killed according to the rites of the Jewish religion. This demand for live poultry is especially heavy and prices are usually somewhat higher in the spring and fall just preceding and at the time of the Jewish holidays. There is also a good demand for live poultry from non-Jewish consumers who prefer to buy fresh-slaughtered birds.

There is a limited demand for live poultry from persons who drive to producers' farms, particularly along well-traveled automobile routes, and many producers have established a reputation for especially desirable table poultry. The possibilities of breeding, rearing, finishing, and marketing table fowl of fancy quality to supply a discriminating consumer trade have been little appreciated; yet there seem to be opportunities for profitable poultry marketing of this kind.

## TRUCK AND EXPRESS SHIPMENTS

Producers who live near good consuming markets frequently ship the surplus cockerels, and the hens that they cull from the laying stock, by truck or express to a poultry dealer. Coops especially manufactured for shipping live poultry may be bought for this purpose or may be made at home. The frames are made of hard wooden pieces (1 by 2½ inches); the top and sides are constructed of wooden slats or rods or are covered with wire netting, thus providing plenty of ventilation. Poorly ventilated coops are likely to result in losses by suffocation, particularly during hot weather, if the coops are overcrowded. The bottom of the coop should be made of ½-inch boards built solid to prevent the birds' toes from sticking through and being injured. The openings in the top and sides of the coop should not be large enough to allow the birds to thrust their heads through, for, in handling, the coops are often slid over one another, and the bird whose head is protruding is likely to be killed. Coops should be built as light as possible, consistent with strength, to save shipping charges.

A coop commonly used for truck or express shipments is 3 feet long by 2 feet wide and 12 inches high. The height depends upon the kind of fowl to be shipped. A coop of these dimensions will accommodate from 14 to 16 small fowl and from 14 to 20 spring chickens. It also may be used for ducks, and will accommodate from 8 to 10 head. A higher coop (16 inches) should be used for geese, and one about 20 inches high for turkeys (fig. 6). From 6 to 8 geese can be shipped in such a coop, and 5 or 6 turkeys in a coop 20 inches high. Extra large fowl and old roosters are rather large for 12-inch coops; they can be better cared for in 16-inch coops which will accommodate from 10 to 12 head of either class. The temperature should be considered in shipping poultry in coops, for in cool weather more birds can be shipped in a coop than in hot weather. Larger coops than those described are often used for shipping poultry and for handling live poultry out of the cars at the terminal markets. A partition should be placed in the center of such coops to prevent injury and loss from the birds piling up when the coop is tipped.

In cooping poultry for shipment, the birds should be sorted so that each lot is as uniform in color, size, grade, and class as possible. A uniform lot is much more attractive, and ordinarily sells more readily, and for a better price. Culls, weaklings, and cripples should not be mixed with the stock of better quality, for if they do not die en route they detract decidedly from the appearance of the lot on the market. If such birds cannot be used in some other way, or sold locally, they should be shipped in a coop by themselves.

In most markets, certain days of the week are more favorable than others for the sale of poultry. The producer should learn which days are most favorable, and arrange to have his shipments arrive on these days.

The best time of day to forward a shipment depends upon the length of the journey and the time of arrival on the market. The shipment should



be on the road as short a time as possible, but it should arrive on the market early enough in the day so that it will be weighed the same day, for when it is held overnight before being weighed there will be a much larger shrinkage. Live poultry should never arrive late Saturday afternoon, for the birds may be held over until Monday before being weighed, and under such conditions there is heavy shrinkage. The most favorable shipping time is early morning if the journey is short and the shipment will arrive in good season the same day. Under these conditions, the lightest shrinkage will result.

The actual shrinkage that may occur varies widely, according to the length of the journey, weather, and the condition of the birds themselves. It may range from 2 or 3 to 15 percent or more, the lower percentage being more common in the case of short shipments and under good conditions. Specially fattened poultry shrinks more than other poultry.

Losses may occur as a result of crowding, poor conditions, rough handling or accident. Losses should be small if the coops are in good condition and the birds are healthy and not crowded during hot weather. Crowding and rough handling may also result in bruising the flesh, which causes the birds to dress out poorly.

When poultry arrives on the market with the crops full, it is said to be "croppy" or "overcropped." Poultry in this condition may be subject to a deduction in weight to allow for the weight of feed in the crops, or it may sell for a lower price. As a rule, birds that will arrive in the market the same day they are shipped may be fed liberally just before shipment, but no feed should be placed in the coops. If they will not arrive at their destination for upward of 24 hours, one or two tin cans filled with corn well soaked in water should be nailed in each coop. The water in the corn helps to satisfy the birds' thirst, whereas water placed in the cans would be likely to spill out, making a wet coop and doing the birds no good. The corn will also help to cut down the shrinkage in weight and still allow the birds to arrive without being in an overcropped condition.

It is not always advantageous to ship either live or dressed poultry to a large distant market in preference to selling locally or in a city nearer home. In any event, before making shipments to a strange market it will pay to write to some of the dealers there to find out what facilities they have for handling poultry of the kind and in the quantity the producer has for sale, and to compare their quotations with the prices paid by local produce buyers on corresponding days, taking into consideration the added shipping charge and the extra expense, if any, for cooping or packing. If it is decided to make the shipment, it is also desirable before doing so to get a report through a local bank or some credit agency regarding the firm selected.

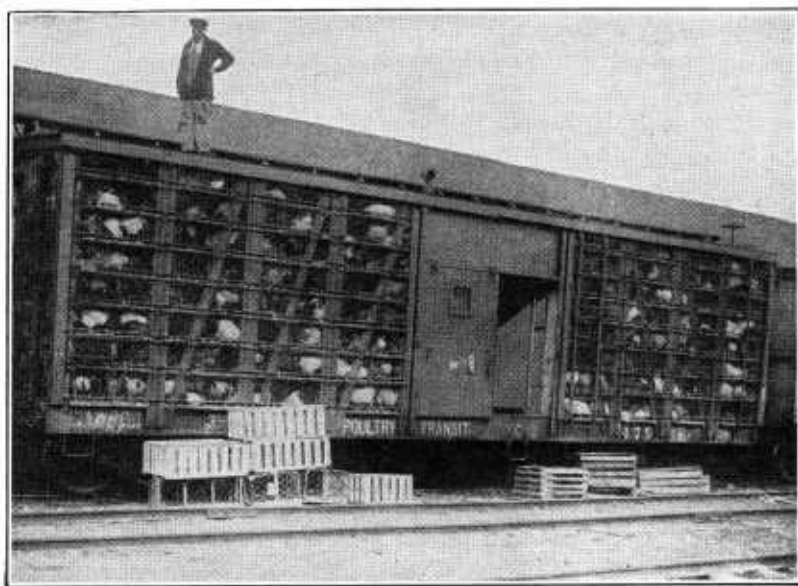
In the producing sections of the Middle West, most live poultry is moved locally by motortruck. When the producer ships direct to the packer he uses coops similar to those described for express shipments and forwards them by local freight, express, or truck. Often the birds are cooped when

sold to local dealers, but sometimes farmers unthinkingly tie or wire the birds' legs together or stuff the birds bodily into sacks. When handled in this way the birds suffer and may even be smothered. Local buyers usually coop and ship the poultry to a packer by truck.

At the packing house the birds are unloaded and placed in coops to await final disposal. A convenient type of coop to use for this purpose consists of a battery of coops built in sections and mounted on rollers to allow easy moving from place to place.

#### FREIGHT SHIPMENTS

If a carlot shipment of live poultry is to be made, the birds are held, fed, and watered in these batteries until enough have accumulated to make up a carload. Cars built especially for the shipment of live poultry are generally used (fig. 7). Such a car is constructed with an aisle in the center with the coops on each side, one above another, from the floor to the roof. Each coop is provided with a feeding and watering trough. The floors of the coops are removable, which permits two coops to be combined into one of double height for shipping geese or turkeys. The outside of the car is covered with heavy wire screening, which provides good ventilation. In the center is a small room for the use of the attendant who accompanies the shipment. Above this is a water tank and beneath is storage space for feed. The birds are more comfortable in such a car, and the attendant can give them better care and do it more easily. A live-poultry car has 128 coops or decks and has a capacity of about 4,600 chickens, which will weigh approximately 15,000 to 18,000 pounds net. It will accommodate from 2,000 to 2,400 geese and from 1,200 to 1,500 turkeys.



FDA 12827

FIGURE 7.—Live poultry is usually shipped in especially constructed freight cars.

Live poultry in such cars may be in transit from 2 or 3 days to a week or more. To reduce shrinkage in weight during shipment and to prevent losses from death, the attendant must give the birds good care and must feed and water them regularly. The last full feed is given on the day before the car is to be unloaded, and only a partial feed is given on the morning of unloading so that the poultry will not be overcropped. In New York City it is trade custom to consider as overcropped any poultry with crops that average more than 2 ounces in weight. Changes in weight during transit may vary considerably and may represent a loss or a gain, depending upon the health and condition of the poultry, the skill of the attendant, and the weather.

Live-poultry cars should be cleaned between shipments and be disinfected when necessary by the company operating them, but this is not always possible. When a car in a dirty condition is received on the shipper's switch it should be given a good cleaning to prevent losses from disease and insanitary conditions.

### ***Finishing or fattening poultry***

The purpose of fattening poultry for the market is to (1) obtain a gain in weight and (2) improve the quality of the flesh and thereby secure a higher price. Producers fatten or finish poultry to a less extent than they do any other class of livestock. Mature hens are usually in a fairly good condition of flesh when marketed, and special fattening methods ordinarily are not required. Young chickens are more growthy and, although they may have made a good growth of bone and frame, they are likely to be in a comparatively thin condition of flesh.

#### **RANGE FATTENING**

When the producer undertakes to fatten his poultry, the most common method employed is range fattening. This method consists of feeding more heavily or feeding a greater proportion of fattening grain, usually corn, for a period of 1 to 3 weeks before the birds are marketed. No other change is made in the care of the birds, and they are allowed to range about the farm as usual. Such a method of feeding will result in a gain in weight, especially if the birds have previously been rather scantily fed and compelled to rustle for most of their food.

With certain classes of poultry, especially the range-raised turkey and the guinea, this is the most practicable method of fattening, for these fowl are semiwild by nature and when shut up in a pen for fattening they are likely to go off feed after a few days and to lose flesh rather than to gain it.

#### **PEN FATTENING**

Producers who make an effort to supply high-class table poultry for a retail trade often fatten their poultry in pens. In pen fattening, chickens are confined to a pen, with or without a small yard in which to range, and are fed heavily on a fattening ration for a period of 2 to 3 weeks. This



FIGURE 8.—Feeding live poultry held in feeding batteries prior to killing.

N 4493

method is used entirely on the Long Island duck farms to get the spring ducklings in shape for market. On these farms the ducklings are generally allowed to range in a yard and in most cases are allowed access to water in which they can swim. Geese fatten readily in pens. On the large goose-fattening farms 100 or more are fed in an open pen. When fattened in small numbers, they are usually confined to small pens in a poultry house and are not allowed access to a yard.

#### **CRATE FATTENING**

In crate fattening, 6 to 10 birds are confined in a small crate or coop and fed for a period of 10 to 14 days. The object is to keep the fowls quiet, so they will use their feed to put on flesh. Crate fattening is not extensively practiced by producers in this country, although some use this method to produce especially fine table poultry.

In crate fattening, the birds are fed a ration composed of buttermilk and ground grain mixed to a consistency that can be poured from a pail into troughs fastened to the front of the coops or crates. Although 8 to 10 days is about the usual length of time for feeding chickens, they will continue to make gains for a longer period, and their market quality will be further improved. But the gains made during the later period are neither so rapid nor so economical, and the 10-day period usually proves to be the most profitable. Young chickens of broiler size, or larger, are most commonly crate-fattened. Hens are sometimes fed by this method to improve

their quality. Other classes of poultry are occasionally crate-fattened, but not to any great extent.

The question may arise with producers as to whether it would pay them to crate-fatten their poultry before shipping it alive to market. As a general rule this does not pay unless the birds are in poor condition. It is more practical to kill and dress fattened poultry before marketing it and thus save the shrinkage, which is especially heavy on shipments of live poultry that have been fattened.

#### **COMMERCIAL FATTENING AT POULTRY-PACKING PLANTS**

A large proportion of the young chickens received at poultry packing plants are large of frame, but somewhat thin. They would not make very desirable table poultry if dressed out in that condition, but they are in excellent shape to respond to feeding and to make quick, profitable gains in weight. Many poultry packers, to secure a gain in weight and to improve the quality of the flesh and the carcass, operate commercial fattening or finishing stations as a regular part of their business (fig. 8).

This has gradually come to be one of the more important branches of the business. Feeding stations, as they are called, are now scattered throughout the important poultry-producing sections of the Middle West and South. Some of these stations are very large and permit the feeding of from 10,000 to 60,000 or more birds at one time. The season's operations begin about June and extend to January. The period of feeding for young stock is from 7 to 10 days; for hens the feeding period is from 5 to 7 days.

The handling of poultry at feeding stations is about as follows: As the birds are received they are sorted, and those suitable for fattening are placed in the fattening batteries. These batteries are made of wood or steel, and each consists of 16 compartments or coops, 8 on a side, arranged in 4 tiers, one above another. The compartments have wire bottoms, so that the droppings fall through onto a flat pan which periodically is drawn out and cleaned. The batteries are usually mounted on rollers or placed on trucks, so that they can be moved readily to the killing room. Each compartment of the battery has a capacity of from 5 to 10 chickens, depending upon the size of the chickens.

As the batteries are filled, they are arranged in rows in the feeding station, aisles being left between so that the feeder can pass through to do his work. The birds are not fed for 12 to 24 hours but are given all the water they will drink. After that the quantity of feed is gradually increased until they are given all they will eat at each feeding period. The birds are usually fed twice a day. The ration consists of ground grains mixed with buttermilk to the consistency of batter. This is poured from a spouted can into troughs that are fastened in front of each compartment in the battery.

As the birds are put into the batteries they are sorted carefully to eliminate weak ones or those in poor condition that will not make profitable gains and are likely to go "off" feed or even die during the fattening process. The feeder must watch the birds carefully and remove for slaughter any that go

off feed or for any reason prove unsuitable for fattening. Satisfactory gains are usually obtained, but they may vary greatly, depending upon weather conditions and the age, condition, and individuality of the birds. The gains in weight may vary all the way from 5 to 30 percent or more of the initial weight.

Results obtained in feeding large numbers of birds show considerable variation. Most commercial feeding stations consider as good any gains of from 5 to 10 percent of initial weight for fowl on a 5- to 7-day feeding schedule, and gains of from 15 to 25 percent for spring chickens on a 7- to 10-day feeding schedule. The young birds consistently make better gains than do fowls.

There is always some death loss among birds that are being fattened. With careful initial selection of the birds placed in the feeding batteries and with good care and the prompt removal and slaughter of any birds that are not standing the feeding well, this loss should not run to more than 0.1 to 0.2 percent daily, provided no disease epidemic occurs.

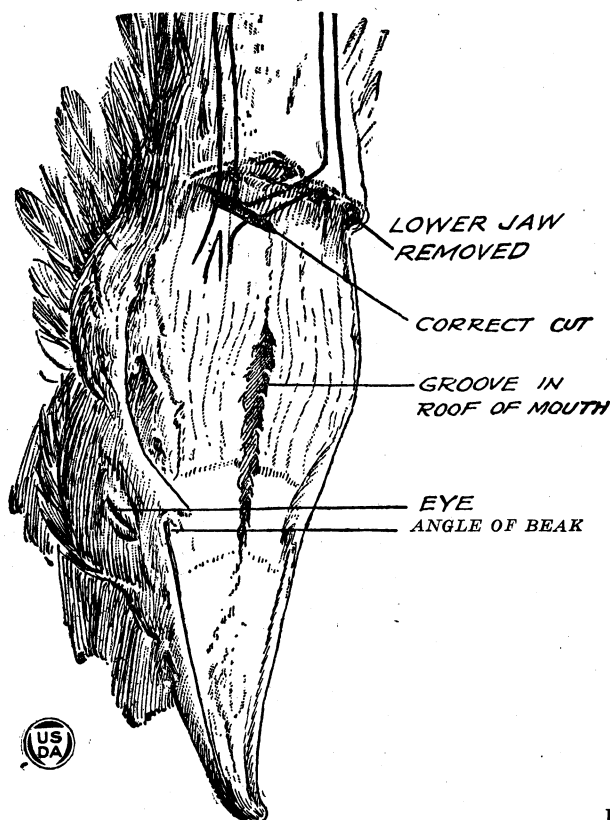
At the end of the feeding period the fattened birds are taken from the feeding room to the slaughtering room in the batteries in which they have been fed. This practice is much better than transferring them to other coops, as the flesh is very soft and easily bruised or injured in handling. The birds are slaughtered and are then bled. When this is completed they are picked, hung on special racks, and run into the chill room to remove the animal heat, after which they are graded and packed. Birds fattened in this way are sold as milk-fed poultry and bring better prices than the ordinary range-fattened or grain-fed stock.

### ***Killing and dressing poultry***

It is not uncommon, particularly during warm weather, for dressed poultry to arrive on the market in bad condition. This may be caused by improper methods of killing, or by improper or inadequate cooling and packing, or by delayed movement in transit. One of the most common evidences of bad condition of dressed poultry is the development of greenish areas on the skin and flesh. Birds showing this discoloration are called "green-struck." When this condition is pronounced, it means that the poultry is unfit for food and must be destroyed. The loss, therefore, is considerable. It is of utmost importance that the killing, dressing, packing, and shipping of poultry be carefully and properly done to safeguard keeping quality and to eliminate loss.

#### **PRODUCERS' METHODS**

Few producers have a sufficient quantity of poultry to justify the expense of installing elaborate equipment for killing, dressing, chilling, and marketing. Their methods at best are likely to be more or less unsatisfactory, and for this reason producers should attempt to dress poultry only when weather conditions are favorable, when the birds are to be sold for immediate consumption, or when they are to be only a few hours in transit to market.



FDA 8839-a

FIGURE 9.—Good bleeding depends upon making the cut in the right place.

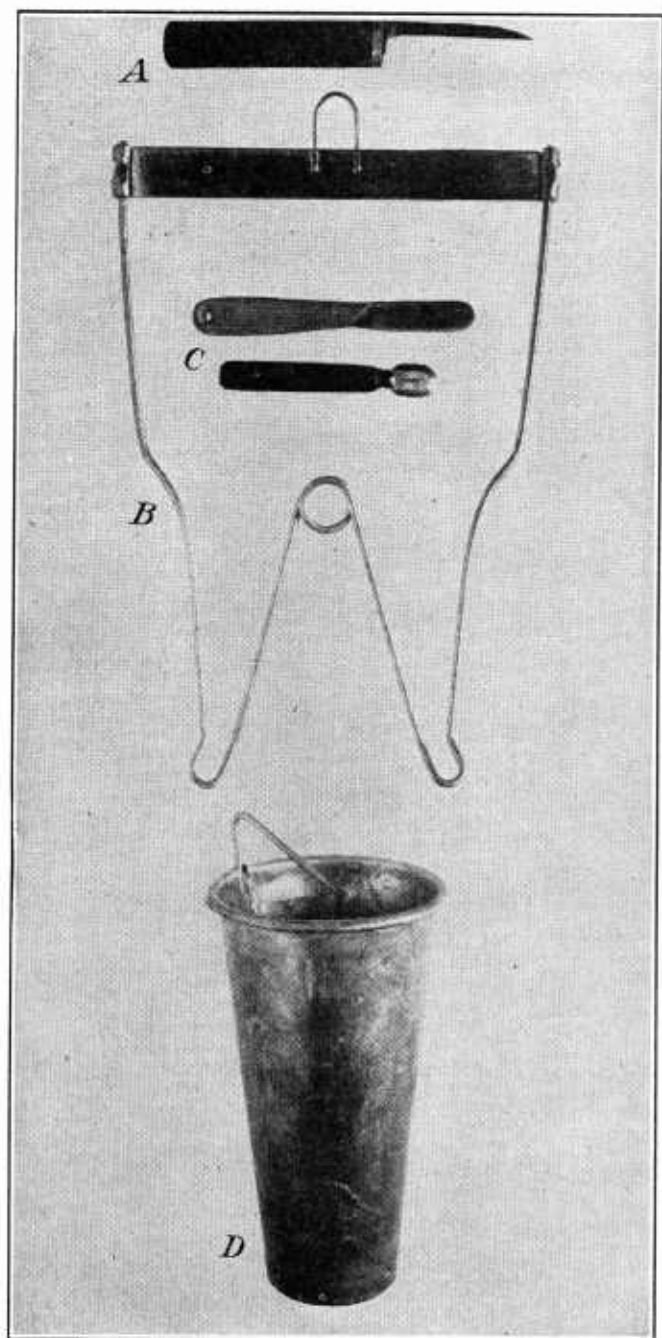
Although different methods of killing and dressing are used, there are some general requirements which the producer must meet in marketing dressed poultry.

It is desirable that birds to be dressed have empty crops when killed. This improves both the appearance and the keeping quality. No solid food should be fed the birds for 12 hours before slaughter, but plenty of water should be given them during this period to help empty the intestines.

The birds must be bled thoroughly. Poorly bled poultry have dark, blood-filled veins in the neck and on the breast and wings, or reddened areas on the skin. These blemishes not only make the poultry less pleasing in appearance but also cause the flesh to spoil more quickly.

Immediately after the birds are plucked, whether by scalding or dry-picking, they must be cooled, either by being placed in mechanical refrigeration or ice-cooled chill rooms, or in tanks of cold water. They should be kept there until the body heat has been thoroughly removed from the carcass; otherwise spoilage will develop more quickly.

The common old-fashioned method of killing poultry for home use is to chop off the head. This will not do in the case of market poultry for the



FDA 8835

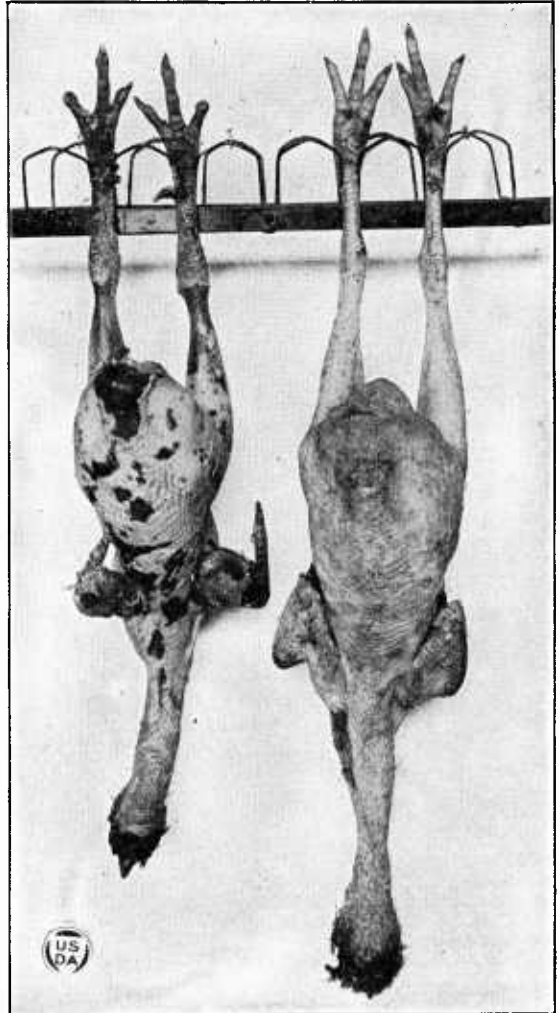
FIGURE 10.—*A*, Knife for bleeding and sticking; *B*, shackle for hanging birds by the feet; *C*, pinning knives; *D*, a blood cup 6 inches high, 3 inches in diameter across the top, and 2 inches across the bottom is very satisfactory.



head must be left on as evidence that the bird was in good health when slaughtered.

A simple method of killing consists of looping a cord around both legs and hanging the bird head down at a convenient height for picking. In place of a cord, a wire shackle which holds the legs apart may be used. The head is grasped in the left hand, the mouth opened, and the jugular vein in the throat just below the base of the skull is cut with one slash of a sharp, narrow-bladed knife (fig. 9). By letting the head hang down and exercising care in making the cut, free bleeding is induced and a well-bled carcass is obtained.

Probably the most successful method involves "sticking," or brain-



FDA 12828

FIGURE 11.—Partial cooking and breaking of the skin, common in scald-picked poultry (left) gives it a less attractive appearance and a lower keeping quality than dry-picked poultry (right) or than semiscalded poultry.

ing," which causes a loosening of the muscles that hold the feathers, thus simplifying picking. Under this method, as soon as the cut has been made for bleeding, the point of the knife is immediately plunged through the roof of the mouth into the brain. If the sticking is successfully done, the picking is much easier.

If the sticking method is not used, the bird may be stunned by a blow on the back of the head before the throat is cut. Some States make stunning compulsory if the birds are not stuck.

Immediately after the cut for bleeding is made, a cup, called a blood cup, should be hung on the lower bill of the bird by means of a hook (fig. 10). This cup catches the blood, and its weight serves to hold the bird more quietly in position and also prevents the blood from being scattered. Sometimes a small weight is used in place of the cup and the bird is hung over a trough or other receptacle which receives the blood.

There are several methods of picking poultry. In some markets a premium is paid for dry-picked and semiscalded poultry, but in other markets it makes little difference which method is used. The producer must, of course, know the demands of the market to which he ships and must meet these demands as far as possible.

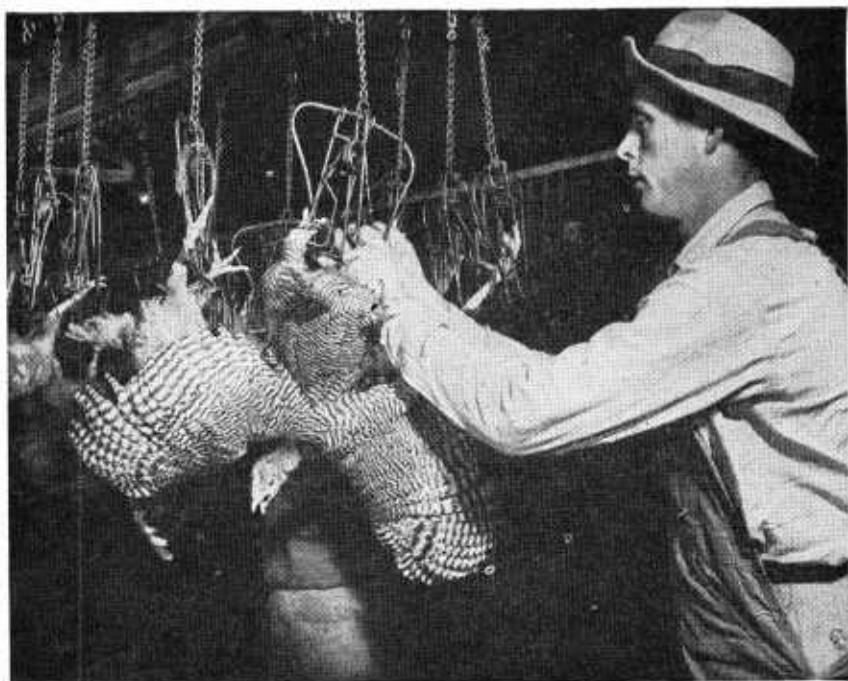
### ***Scald picking***

When the scald method of picking is used the bird is allowed to hang until it is thoroughly bled out. It is then taken down and, held by the head and feet, is plunged into a tank of water which is kept at a temperature of about 180° F. The bird is thoroughly soured to permit the water to penetrate through the feathers to the skin, but should be scalded only long enough to make the feathers pull easily. Further scalding partially cooks the skin and flesh, which gives the carcass a less attractive appearance and lowers its keeping quality (fig. 11). It is difficult to obtain the exact amount of scalding required, so care must be taken. The feathers are removed as rapidly as possible while the bird is suspended by its legs or is held on a bench or table.

When birds are scald-picked, it is a common practice to "plump" them as soon as the plucking is finished by dipping them first in hot water and then in cold water. This gives them a somewhat rounded, plumper appearance. Care must be taken in both plumping and in scalding to be sure that the water used is not so hot as to cause discoloration of the skin.

### ***Semiscald picking***

A modified method of scald picking is known as the semiscald or slack-scald method. In common use in poultry-packing plants (p. 32), this method may be adapted for use by producers or small dressers. Under this method, after the bird is killed and bled the carcass is plunged into water maintained at a temperature of 125° to 128° F. This temperature must be constantly maintained, for if the water is too hot it causes discoloration of the skin, and if too cool it makes the removal of the feathers



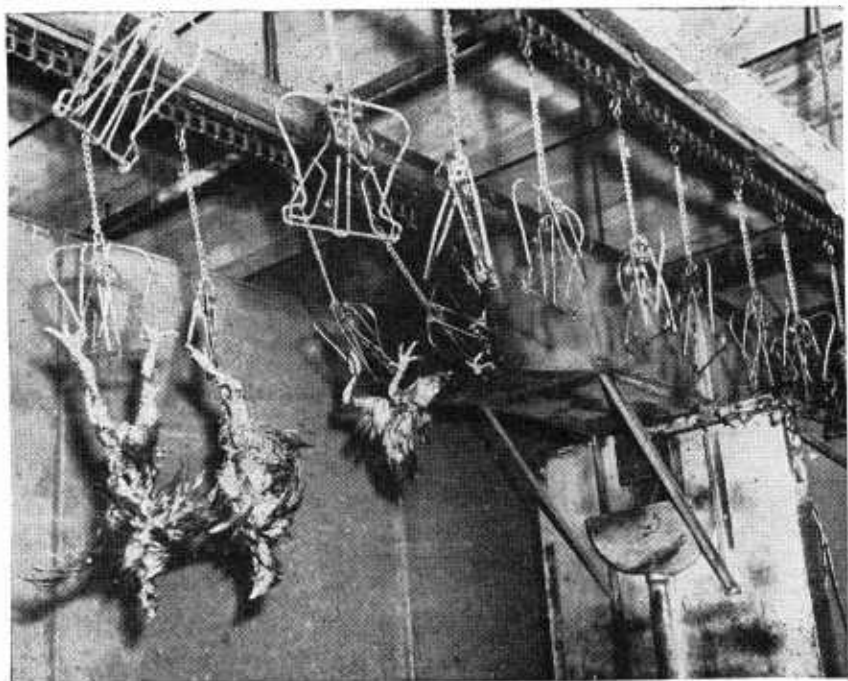
N 4387

FIGURE 12.—Suspending live poultry by the feet in shackles attached to a traveling chain. The poultry will remain in these shackles until the killing and picking operations are completed.



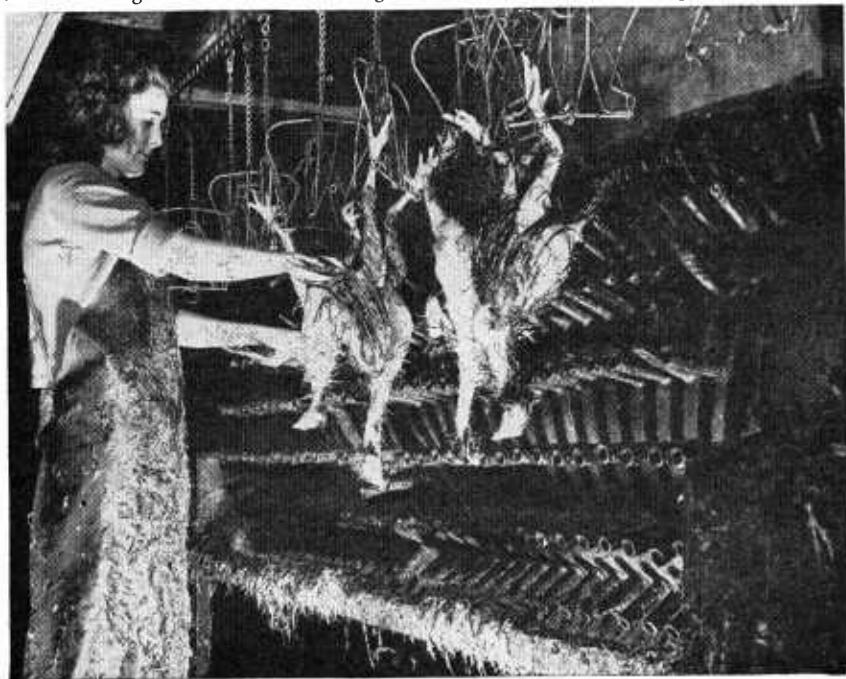
N 4587

FIGURE 13.—Outside cut for killing poultry. Killer pauses to see if blood flow is adequate.



FDA 2592

FIGURE 14.—The poultry on the chain conveyor has just passed through the semiscald bath located at the right. The birds are moving to the left, where the mechanical pickers are located.



N 4533

FIGURE 15.—After passing through an automatic picker, most of the remaining feathers are removed by holding each bird against the revolving rubber fingers of a second machine.

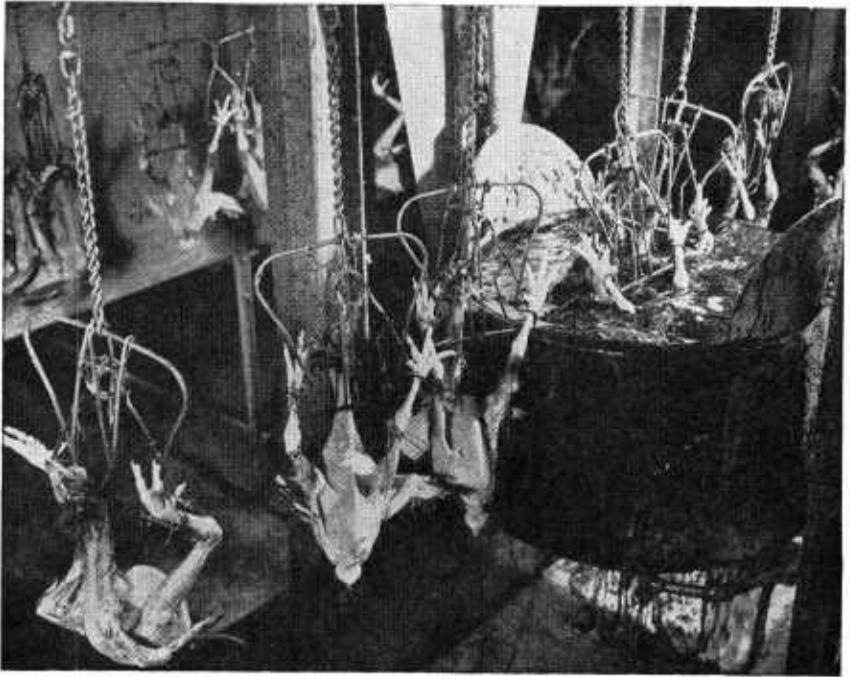


FIGURE 16.—The carcass is automatically dipped in a vat of molten wax.

N 4539



FIGURE 17.—Stripping the wax from the carcasses. Most of the remaining feathers and pin feathers are imbedded in the wax and are removed when the wax is stripped off.

N 4538

difficult. After the removal of the main wing and tail feathers, the carcass is agitated in the water from 15 seconds to 1 minute, the length of time depending upon the class of poultry. Usually 25 to 35 seconds is satisfactory, if the bird is not too large or too old. The carcass is then hung up and the feathers picked off instead of being rubbed off as is done with scalded poultry. After being plucked, the carcass must be carefully dried. Unless it is dried before it is packed, damage from mold is likely: From this point, it is handled in the same way as dry-picked poultry.

When this method is properly carried out, the carcasses have every appearance of dry-picked poultry. The plucking can be accomplished more rapidly than in dry picking, and the pinfeathers can be more completely removed. There is, therefore, a higher percentage of first-grade poultry. The cold storage of semiscalded poultry has generally been successful.

### ***Dry picking***

More difficult than scald picking, dry picking requires considerable skill and practice to obtain speed and best results. When poultry is to be dry-picked, it should be killed by the sticking or braining method, which loosens the feathers so they may be easily plucked. As soon as the bird is stuck, the blood cup or weight should be hooked on, and the plucking begun immediately. If plucking is delayed, the feathers soon set and then are far more difficult to remove.

The large tail and wing feathers are pulled first and then the feathers from the breast and the sides. These are followed by feathers from the thighs and legs and next the soft body feathers between the legs and the hip and back feathers. Then come the neck feathers, and finally the small feathers on wings. In plucking, care must be taken to pull with the slant of feathers rather than against it. In order to prevent tears, care should also be taken to pluck the feathers over the fatted portion of the hips toward the last; otherwise reddened hips are likely to result. The plucking should be done systematically and fairly cleanly as each section is covered. Too much attention should not be given to pinfeathers the first time over, as it is necessary to get over the entire body and remove the bulk of the feathers while they come out easily. This rapid removal of the bulk of the feathers is commonly known as roughing. After the bird has been rough-picked, the picker should go over the carcass again to remove any feathers missed and to pluck all pinfeathers. This process is known as pinning. If the crop contains much feed, it must be removed. It is much better, however, to withhold feed from the birds for a sufficient length of time before killing so that the crops will be empty.

### ***Combination method***

A combination of wax-plucking (p. 32) and semiscalding also may be used by producers or small dressers. Specially prepared wax must be bought for this purpose. It must be brought to a molten condition and

maintained at the temperature most favorable to its use. Temperature control of the molten wax may be obtained by placing it in a pail or similar receptacle, which in turn is placed in a larger container of warm water. As the temperature of the wax begins to drop, hot water can be added to the water bath and a suitable temperature maintained in this way. The carcasses must be dry when dipped in the wax. At least two dips are needed and more may be necessary. After the dipping in wax is completed, the carcasses are sprayed with cold water to harden the wax. The wax is then carefully pulled off, taking with it the remaining feathers and pinfeathers. The feathers and dirt that accumulate in the wax may be skimmed out, and the wax may be used again.

#### **PLUCK POULTRY CLEAN**

All poultry should be plucked clean; that is, all the feathers should be removed. This is more sanitary than to leave part of the feathers on the carcass and on the whole improves the appearance of the poultry.

If feathers are left on the carcass, they must later be removed at some inconvenience either by the butcher or the housewife. Wing tips carrying feathers, however, can be cut off without sacrificing any appreciable amount of edible carcass. At present the most usual practice is to pluck clean, but a few dressers still prefer to depart from this practice. Some fancy box-packed fowl and some turkeys are dressed with a row of fan feathers left on the last joint of the wings. Formerly, capons had the feathers left on the last joint of the wings, the tail, the thighs for about one-third of the distance from the hock joint, and the neck for about one-third of the distance from the head. At present, however, there is a growing tendency to pluck capons clean. Long Island ducklings may have the main wing and tail feathers and a part of the neck feathers left on the carcass, but this method of dressing does not produce an attractive carcass. Guineas, because of the dark color of their flesh, were formerly displayed for sale unplucked, but most guineas today are fully plucked. Pigeons may be sold unplucked, and squabs are occasionally so marketed but are more often cleanly plucked.

#### **COOLING**

Birds plucked, whether by scalding or dry-picking, must be cooled as promptly as possible. Sometimes they are hung in the air, if the temperature is cool, but this is not a desirable practice, for it is improbable that the air temperature will be at the most favorable point for this purpose. An excessive temperature delays cooling too much and lessens the keeping quality of the bird, whereas a temperature sufficient to freeze the flesh is likely to harden it while the interior of the body is still warm and to result in early spoilage.

If mechanical refrigeration or ice-cooled chill rooms are available, the birds should be held at 32° F. or as near that temperature as practicable to get the most desirable results. As a rule such facilities are not available



FIGURE 18.—Removing pinfeathers with a pinning knife.

N 4546

to the producer, and cooling with water is resorted to. When it is, the carcasses are placed in tanks of cold water as soon as they are plucked. If a plentiful supply of running cold water is available, it should be brought into the tank at the bottom and allowed to overflow at the top. Usually it is necessary to place ice in the water in order to attain the desired chilling. It is important that the birds be left in the water until the body heat has been thoroughly removed from the carcass; otherwise spoilage will develop more quickly. Where a comparatively small quantity of poultry is chilled in ice water and where any considerable delay in arrival at the market is improbable, 4 or 5 hours will be sufficient to chill the carcasses. They should then be packed in layers of ice and shipped immediately.

#### COMMERCIAL METHODS

In the poultry-packing house the same general methods are used and principles observed as those described for the producer, but the business is much more highly specialized, and the facilities are far superior. Formerly, in most poultry-packing plants the great bulk of poultry was dry-picked. In dry-picking, the killer usually "roughs" the birds; that is to say, he removes only the bulk of the feathers. If he is very expert, he may be able to accomplish this in 1 minute. The birds are then turned over to the "pinners," who go over them carefully and remove the pinfeathers and any scattered feathers left on the carcass. A rougher will keep several pinners busy.

Most up-to-date poultry-packing plants at present utilize the semiscald



method of plucking and have installed machinery to do the semiscalding automatically. The birds are hung by the feet in shackles (fig. 12) that are attached at convenient intervals to a chain conveyor. They are immediately cut for bleeding (fig. 13). This is accomplished either by cutting the main arteries of the neck from the inside through the mouth or by the kosher method of cutting the throat from the outside. The main wing and tail feathers may then be pulled, or this may be delayed until after semiscalding. A chain conveyor then carries the birds to and through the scalding tank, during which time they are bleeding if they have been properly cut. As the birds travel through the scalding tank, they are agitated in such a manner as to cause the water to penetrate the feathers thoroughly. The speed of the conveyor can be adjusted so as to keep the carcasses in the water the optimum time, from  $\frac{1}{2}$  to 1 minute, depending on the size and maturity of the birds. The temperature of the water also can be carefully regulated by thermostatic control. It is important that the temperature should be from 125° to 128° F, depending on the class of poultry. When the carcasses emerge from the scalding (fig. 14) they may be removed from the conveyor and hung on strings for plucking. More commonly, they continue on the conveyor through further processes.

As the carcasses come from the scalding tank, the bulk of the feathers are plucked off rapidly, leaving scattered feathers and pinfeathers. The plucking may be done either by hand or by use of a mechanical picker. The mechanical picker consists of a rapidly revolving cylinder studded with rubber fingers. The carcasses, still hung from the conveyor, are pressed against this revolving cylinder (fig. 15) and shifted in position so that all parts of the body are contacted. The rubber fingers remove most of the body feathers so that the carcasses as they travel on have only scattered body feathers, small feathers, and pinfeathers.

The carcasses are next prepared for wax-plucking, the use of which has become almost universal in the last 5 years. As the first step, the birds, still on the chain conveyor, pass through a drying compartment or tunnel where a blast of hot air dries the carcasses and the feathers. Drying is necessary because the wax must make a strong union with the feathers and will not do so if the feathers are wet. The head of each bird is now raised up and hung on the shackle with the feet. The carcasses are then carried over containers of a special molten-wax preparation maintained at a constant and proper temperature regulated by thermostatic control. They are dipped twice, so that the wax covers the entire carcass except the feet and head (fig. 16). They then pass through a tunnel or compartment where they are sprayed thoroughly with cold water to harden the wax coating. Next, the wax is stripped from the carcasses in sheets (fig. 17), taking with it most of the remaining feathers and pinfeathers and the scale from the skin and dirt from the skin pores. This cleansing produces a bright, attractive carcass. The birds travel farther on the conveyor, giving a gang of pinners an opportunity to remove any remaining feathers or pinfeathers and in

general to clean the carcasses well (fig. 18). The mixture of wax and feathers may be run through a wringer which removes most of the wax from the feathers. This may be saved, remelted, and used again (fig. 19).

As soon as plucking is completed, any feed remaining in the crop should be milked out through the mouth so that the crop is entirely empty. The blood clot should be removed from the mouth or head and the head wiped to remove any remaining blood. If the feet are dirty, they must be cleaned with a stiff brush and water; otherwise, they will soil any other carcasses with which they come in contact when packed for shipment.

The next step in preparing poultry for packing is to remove the body heat. This is very important. If the body heat is not removed adequately, the dressed carcasses will not keep well, and later certain portions of the flesh may show a greenish discoloration, a condition called "green struck." Cooling or chilling may be accomplished by exposing the carcasses to cold air in a refrigerated chill room or by cooling with water. A simple and common method of cooling is to place the carcasses in large vats or tanks of water (fig. 20). Ice may be put in the water or the water may be kept cool by a constant flow which enters at the bottom of the tank and drains off at the top. Still another method is to hang the poultry on ordinary cooling racks and spray with water cooled to or near 32° F. Still another method, not yet in general use and referred to as the "shock cooling" method, consists of spraying the poultry with brine cooled to below freezing temperature, possibly from 20° to 32°. These spray methods hasten the initial cooling and shorten the total time required.

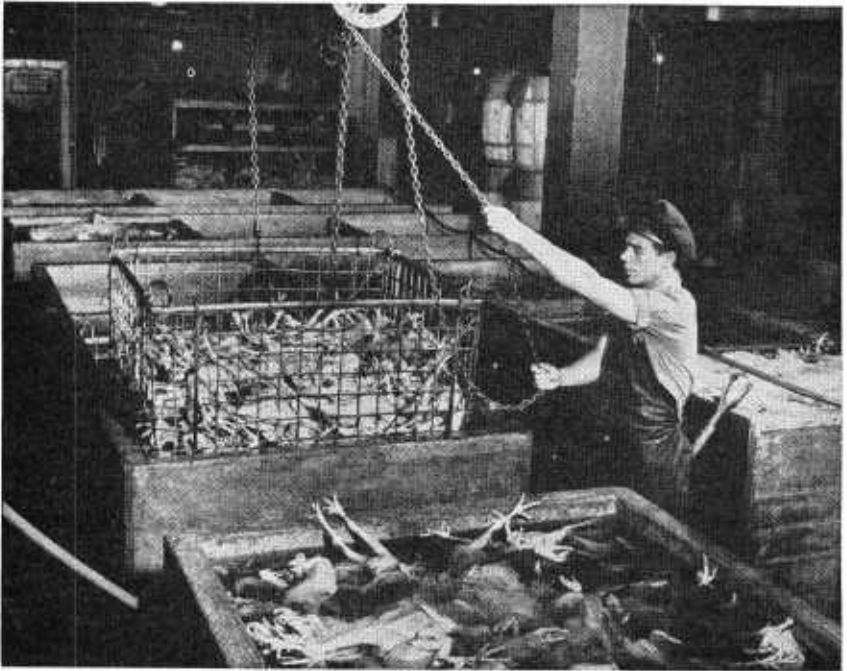
When poultry is air-cooled, the carcasses are hung on metal racks mounted on rollers for convenience and especially constructed so that when the birds are hung by their feet, they do not rest close together and thus delay cooling. Such a rack will hold about 180 birds. As soon as a rack is filled, it is wheeled into a chill room (which should be maintained at a temperature of 32° F.) and kept there until the carcasses are thoroughly chilled, usually about 24 hours if cooled entirely by air. When the carcasses are partially chilled with water or brine, the cooling may be completed in the chill room. The heads are wrapped in kraft or parchment paper while the carcasses are hanging on the racks. This is done after the water chilling is completed and the birds are dry or before they are placed in the chill room. The shrinkage in weight in killing and picking ranges from about 11 to 14 percent for chickens and somewhat less for hens. Water cooling reduces this shrinkage.

Formerly, all poultry, except a limited quantity for local sale, was shipped to market undrawn; that is, the entrails were not removed or the head and feet cut off, but the birds were bled and the feathers plucked. During the last few years, considerable progress has been made in the marketing of all classes of poultry full-drawn at point of slaughter. Such poultry is first chilled, to remove all body heat, and then full-drawn. The entrails are removed, and the head, feet, and shanks are cut off. The



N 4568

FIGURE 19.—The feathers are skimmed from the vat of melted wax and placed in a centrifugal wringer to reclaim the wax.



N 4549

FIGURE 20.—Removing body heat by immersing dressed poultry in ice water.



N 4563

FIGURE 21.—After being cooled, the birds are graded and weighed and sorted, ready for packing.



N 4567

FIGURE 22.—Packing dressed poultry in barrels with alternating layers of poultry and crushed ice.

gizzard is cleaned, wrapped in parchment with the heart, liver, and neck, and placed inside the carcass. The drawn carcasses are then attractively shaped and wrapped in transparent paper and packed individually or six to a fiber box or other container. The packages are then placed in low-temperature freezers ( $-10^{\circ}$  to  $-25^{\circ}$  F.) or in special quick-freezing apparatus. The frozen poultry must be held, transported, and retailed in a hard-frozen condition. Certain classes of full-drawn poultry may be cut up and packed in cartons. Whether whole or cut up, the poultry is ready for cooking and is generally advertised as ready-to-cook poultry.

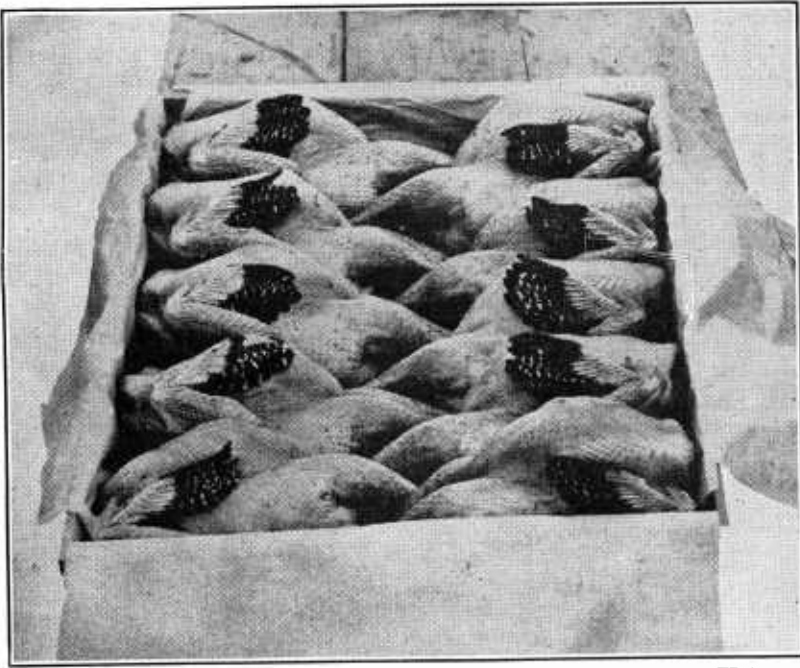
A steady growth in the sale of poultry has resulted from the improved practice of marketing poultry of good quality, dressed for convenient selling and ready for immediate cooking, and put up in attractive packages. It is probable that this trend will continue. One disadvantage in the sale of full-drawn poultry is that a higher price per pound must be charged for it than for undrawn poultry. This difference in price is more apparent than real, however, because in the drawn carcasses the head, feet, legs, and entrails have been discarded and this waste eliminated from the product purchased. An interesting development has been the sale of cut-up poultry by retail establishments. Quite a number of stores will now sell breasts, legs, backs, or wings, whichever may be desired, but, of course, at different prices.

Much of the full-drawn poultry is used by hotels and restaurants, but there is a large and increasing sale to housewives. A great deal, probably more than half, of the full-drawn poultry now sold is Government-inspected at point of preparation, in order to make sure it is healthful and wholesome.

Scald picking is a commonly used method for removing the feathers from ducks and geese. The down of these birds is very difficult to remove and often requires special methods. Part of this down can be rolled off with the hand when moistened with water, and part of it is sometimes shaved off with a sharp knife. In some cases ducks and geese are steamed instead of being scalded, by being hung in a steam vat until the feathers and down pluck easily. If a steam vat is not available, steaming is sometimes accomplished by dipping the fowls in hot water or by laying them for a short time on a rack suspended above boiling water and then wrapping them in a cloth or blanket to allow the steam to penetrate the feathers.

Feathers form a valuable product of poultry-packing plants. Those from dry-picked or semiscalded poultry are more valuable than those from scalded poultry. Goose feathers are most valuable, followed in order by duck, turkey, and chicken feathers. In commercial plants the coarse feathers and the soft body feathers should be kept separate, as they are sold separately.

Feathers from dry-picked poultry may be cured by being spread out in a thin layer on the floor of a well-ventilated loft and turned or stirred up from time to time until they are well dried, or they may be dried in a heated feather drier. Feathers from semiscalded poultry are run through a centrifugal wringer to remove most of the moisture and are then treated in



FDA 8832

FIGURE 23.—A box of turkeys packed breast up. Each side liner should be long enough to reach the opposite side of the box.

a heated drier until thoroughly cured. After feathers are thoroughly dried they are placed in large sacks for shipment to market. It is important that feathers be thoroughly cured before they are shipped; otherwise they are likely to heat and mold and arrive at the market in bad condition, which will seriously affect their value.

### ***Grading and packing***

Usually producers do not have enough dressed poultry to market to make it practicable to do much in the way of grading, but an effort should be made to have as much uniformity as possible in appearance and size.

In commercial packing plants, grading is an important process. After being chilled, the birds are sorted according to size and kind and are graded on the basis of their weight, degree of fleshing and fat covering, and freedom from blemishes, torn skin, pinfeathers, and deformities. Grading should be done in a chilled room, preferably by daylight, as this permits a more careful examination and grading according to color (fig. 21). Most producers who ship dressed poultry to market must pack the birds with ice, as they have no adequate facilities for dry cooling and packing. Poultry-packing houses operating in the North Atlantic States also pack in ice. Barrels are the most convenient package to use in ice packing. In barrel packing the dressed carcasses are packed by placing first a layer of ice and then a layer of poultry (fig. 22), covering this with a layer of cracked ice,

and continuing to alternate in this manner until the barrel is filled. Enough space should be left on top of the last layer to provide for a good header of large chunks of ice. The barrel should be covered over the top with a piece of burlap.

When poultry is dry-packed, as in most of the large poultry-packing houses of the Middle West, it is customary to box-pack them. Usually the boxes accommodate 12 birds. The style of packing may vary.

Under commercial conditions in the larger packing houses, the barrel pack is used largely for the No. 3 poultry and for the old cocks and scald-picked poultry—in other words, for the poultry of less desirable grade. The more desirable poultry is packed in wooden boxes, with 12 birds to a box. The style of packing differs somewhat.

The most common method of box-packing poultry and the one generally considered to be most desirable is to place the birds in a single layer consisting of two rows of six each, breast up, heads tucked under the bodies, and the feet of the carcasses in each row underneath the bodies in the opposite row (fig. 23). The boxes are lined with parchment or waxed paper, and some packs of broilers may be individually wrapped. All boxes and barrels should be stenciled to show the kind of poultry the package contains, and the gross, tare, and net weights. In commercial plants the poultry is held in the chill room at a temperature of 32° F. or lower, until it is shipped to market. Hard-chilling of the poultry at a temperature of 10° or even lower is desirable and is being practiced to an increased extent because when so treated the poultry arrives on the market with a better bloom and color than when higher chilling temperatures are used.

### ***Shipping dressed poultry***

Dressed poultry is usually shipped by the producer comparatively short distances to market, and as ice-packed shipments must be moved quickly, motortruck is generally used. Even then there is always danger of dressed poultry spoiling if delayed en route. If dressed poultry is to be shipped long distances, as from the packing houses of the Central West to the consuming markets of the Atlantic seaboard, it is generally moved by refrigerated freight. If dry-packed and shipped in refrigerator cars the poultry will arrive in good condition if the cars are kept properly iced.

In icing a car for shipping poultry, 10 to 15 percent of salt is used, and the car is closed to allow the temperature to be reduced to 35° F. or less before loading begins. Loading should be accomplished quickly to prevent any unnecessary rise in temperature. When dressed poultry is shipped in a car with other produce, especially with eggs, it is necessary to brace each portion of the load separately; otherwise the heavy packages of poultry are likely to cause damage to the eggs. The poultry should be loaded at the ends of the car next to the ice bunkers and on the bottom of the car, as the temperatures are lowest at these points. If salt is mixed with the ice in the bunkers to lower the temperature, the eggs may be frozen if they are placed next to the bunkers.

## ***Commercial storage of dressed poultry***

When dressed poultry is not moved immediately into channels of consumption it must be held in cold storage in a frozen condition at a temperature of about 0° F. or below. When the poultry has been chilled but not frozen and is to be cold-stored it should be removed immediately to a sharp freezer, where the temperature is -5° or lower. The boxes should be loosely piled or staggered to allow a free circulation of air and bring about quicker freezing. A low temperature and quick freezing are very desirable, since the poultry will have a better appearance when thawed if it has been frozen quickly. After the poultry is frozen hard, it should be removed to the permanent storage room, where a uniform temperature should be maintained. Experimental work has shown that freezing and holding of poultry at temperatures as low as -20° or -30° is very desirable. The results indicate that poultry handled in this way keeps better than poultry frozen and held at higher temperatures; it also has a better appearance, particularly from the standpoint of greater freedom from pockmarks or freezer burn—that is, the white dry spots or areas on the skin—which are common on poultry held for any considerable time under usual storage temperatures and conditions. These blemishes, if pronounced, detract considerably from the appearance of the carcasses.

The period of time dressed poultry may be held in cold storage varies, but normally it moves out of storage within a year's time. There are various State laws regulating the cold storage of dressed poultry and other products, some of which provide that the dates on which the poultry goes into and comes out of storage must be marked on the packages and place limits on the length of time that poultry may be held in cold storage.

When dressed poultry has been held in cold storage it preferably should be marketed while frozen. It is best thawed out in the consumer's refrigerator just before being used. It is a common practice to thaw out frozen stock by placing it in cold water before it is displayed for sale, because some consumers are averse to cold-storage products and the thawed-out birds have more nearly the appearance of being freshly killed. Poultry thawed out in this way is likely to spoil quickly. It must be sold immediately and until it is sold, it must be kept at a cool temperature. Sometimes poultry that is thawed out is not needed for immediate consumption and is put back into storage. This is bad market practice, for frozen poultry that has been thawed out will not keep so well after refreezing, and poultry thawed in water is especially likely to deteriorate when put back into the freezer.

## ***Canned poultry***

Poultry is canned commercially in a large variety of forms. The most common canned products are whole and half chicken, boned chicken, chicken-a-la-king, creamed chicken, and various forms of chicken soups and broth. More than 25,000,000 pounds of dressed poultry are used annually for this purpose. At present, most of this poultry is canned in plants that



have requested and are receiving Federal inspection of the poultry used. This is a regular veterinary inspection to determine that the poultry is free of disease and to insure that the poultry meat to be canned is otherwise sound and wholesome for human food. Poultry products canned under Federal inspection bear the official inspection legend on the labels of the cans in which they are packed. This legend reads, "Inspected and Certified by U. S. Department of Agriculture."

### ***Points for the producer to remember***

#### **IF YOU MARKET POULTRY ALIVE:**

- Study your shipping facilities and determine when shipments will arrive on the market. Plan to make your shipments so that the birds will be cooped as short a time as possible, thus reducing the shrinkage.
- Do not overcrowd the birds in the coops, particularly during hot weather, or your losses may be heavy.

#### **IF YOU MARKET DRESSED POULTRY:**

- Fatten the birds before dressing, since this usually pays well.
- Dress the poultry to meet the demands of your market.
- Chill immediately and thoroughly after killing and picking.
- Never draw poultry unless your particular trade demands it.
- Do not risk shipping dressed poultry in warm weather without packing it in plenty of ice.

#### **IF YOU MARKET EITHER LIVE OR DRESSED POULTRY:**

- Never have shipments arrive at the market Saturday afternoon.
- Find out which days are best on your market and plan your shipments accordingly.

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